

**VIRGINIA STANDARDS OF LEARNING**

**Spring 2004 Released Test**

# **END OF COURSE EARTH SCIENCE**

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**LARGE PRINT FORM**

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## DIRECTIONS

Read each question carefully and choose the best answer.

## SAMPLE

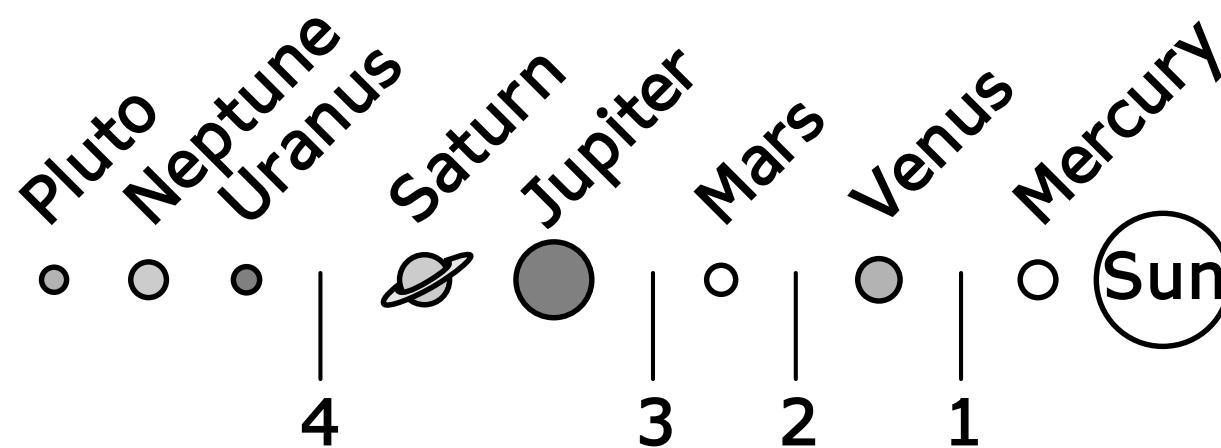
Which of these can be used to measure atmospheric pressure?

- A An anemometer
- B A barometer
- C A thermometer
- D A seismometer

1 Because of the unique position of the Earth in the solar system, life has flourished due to the presence of

- A helium
- B volcanoes
- C liquid water
- D salt

2



At what position would Earth be found in the solar system diagram shown above?

- F 1
- G 2
- H 3
- J 4

3 What element is the main component of most stars?

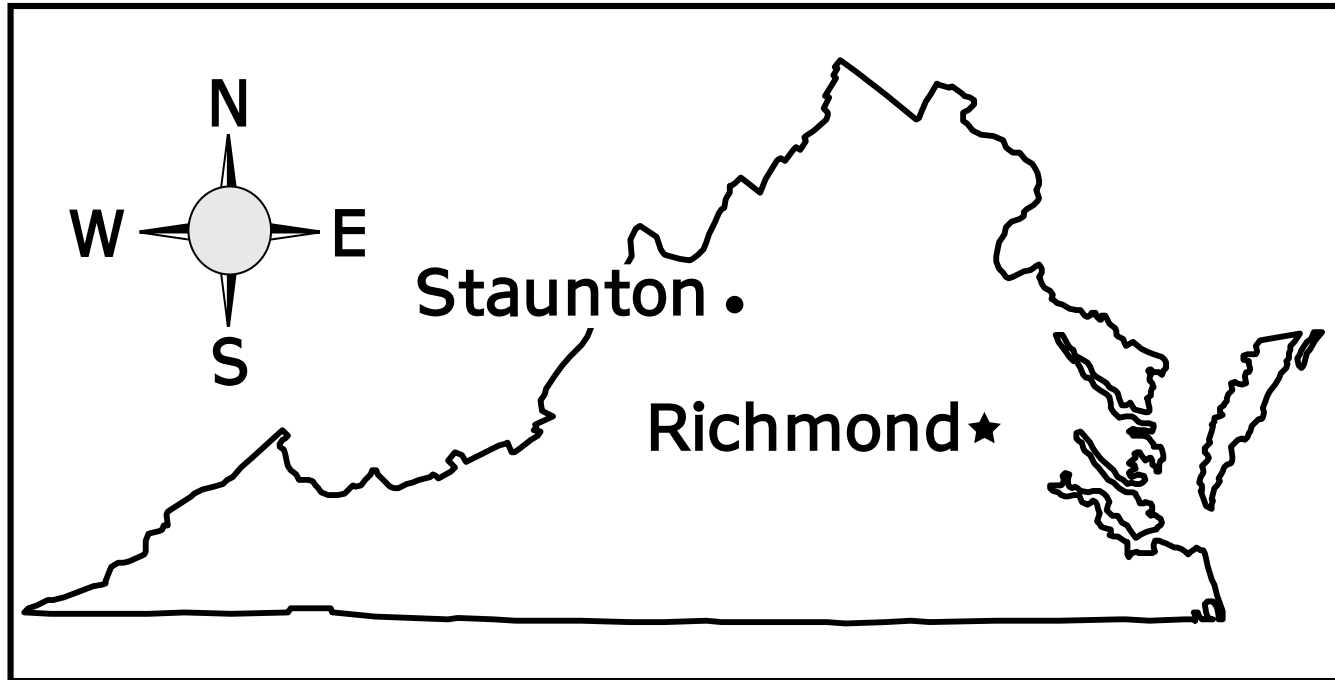
- A Nitrogen
- B Iron
- C Hydrogen
- D Oxygen

4 The hypothesis for the cause of the dinosaurs' extinction that has the MOST scientific support links their extinction to

- F a long drought
- G the appearance of man
- H the increase in numbers of mammals
- J a large object from space hitting the Earth

- 5 Approximately 99.7% of all water on Earth is found in oceans, seas, ice, and the atmosphere. Based on this information, which statement is MOST accurate?
- A The Earth's freshwater supply is infinite.
  - B Less than 0.3% of Earth's water is drinkable.
  - C Humans are not dependent on ocean water.
  - D The water cycle returns all usable water to the sea.

6



In what direction is Staunton from Richmond?

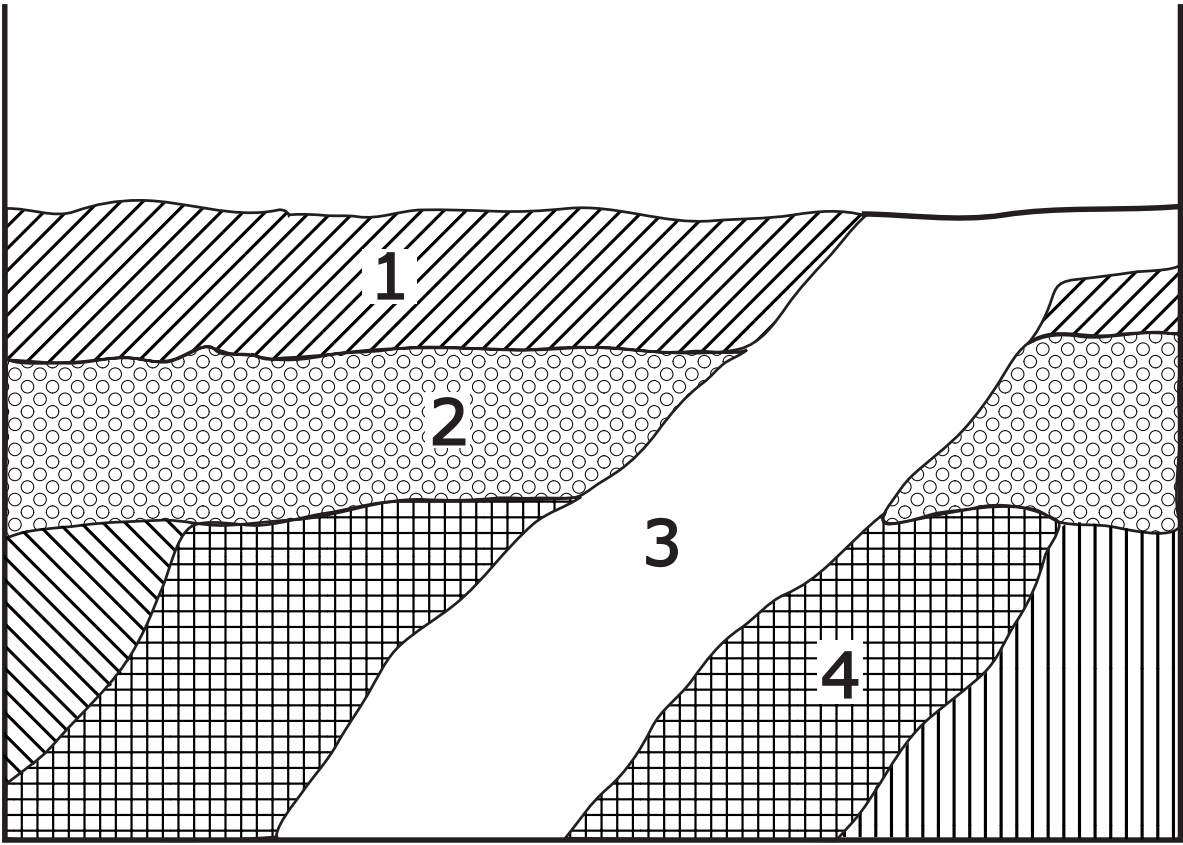
- F Northeast
- G Northwest
- H Southeast
- J Southwest

- 7 During which portion of the Earth's revolution around the sun is the Northern Hemisphere tilted toward the sun?
- A Vernal equinox
  - B Summer solstice
  - C Autumnal equinox
  - D Winter solstice
- 8 What is the best evidence that many different geologic periods are represented in Virginia?
- F The length of its rivers
  - G The location of the Piedmont
  - H The presence of fossils of different ages
  - J The amount of chemical weathering



9 Volcanic ash has occasionally formed molds of animals. This occurs when the ash covers the animal and

- A replaces the animal's soft tissues
- B enters the animal's body cavity
- C hardens before the animal decays
- D mineralizes the animal's bones



Which area is most likely the oldest section of rock?

- F 1
- G 2
- H 3
- J 4

- 11** Rock layers tell a story about their past. What is the basic assumption that is made when reading this story?
- A** The composition of the Earth’s atmosphere has been constant.
  - B** The Earth’s crust cooled and then remelted before rock layers began to form.
  - C** The processes in the rock cycle were the same in the past as they are today.
  - D** Chemical reactions in the past were slower than they are today.

12 A rain forest is found at the base of Mt. Kilimanjaro, and the summit is snowcapped. Which of the following would BEST account for this?

F Temperature differences due to elevation changes

G Climate differences due to seasonal changes

H Differences in precipitation due to formation of a rain shadow

J Climate changes due to changes in latitude

13 Which of the following was primarily responsible for the development of life outside of the oceans?

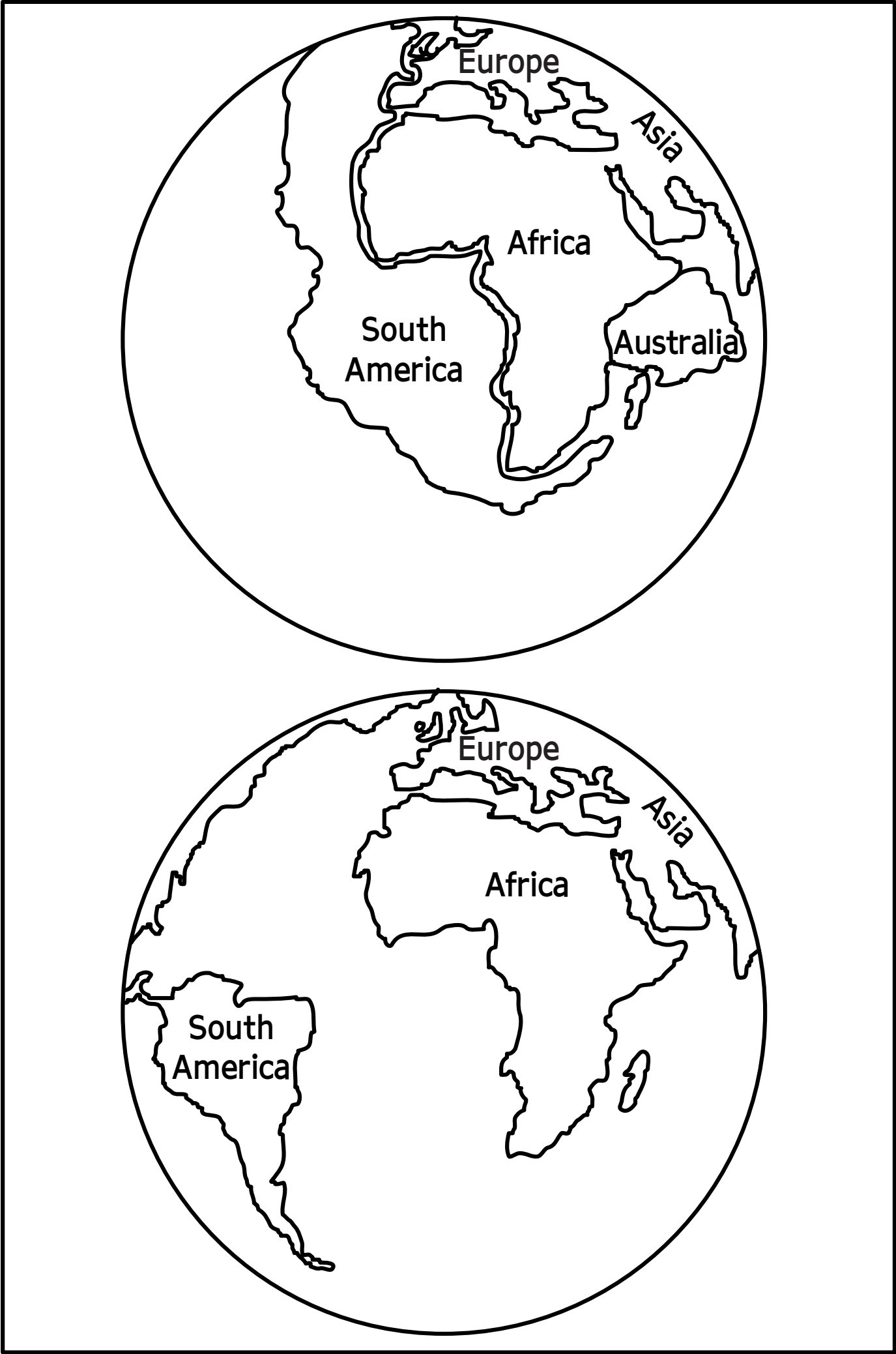
A A decrease in atmospheric hydrogen

B A decrease in atmospheric carbon dioxide

C An increase in atmospheric nitrogen

D An increase in atmospheric oxygen

**Turn the page  
and  
continue working.**



The diagram is similar to one drawn by Antonio Snider-Pelligrini in 1858. What data was he trying to explain with this diagram?

- F The distance between the Eastern and Western Hemispheres
- G The reason for similar fossils in Africa and South America
- H The presence of earthquakes on different continents
- J The variations in depths of the Atlantic Ocean

15 Why do stars appear to change position during the night?

- A Earth rotates on its axis.
- B Earth revolves around the sun.
- C The stars are moving away from each other.
- D Stars are very far away from the solar system.

**16 Which of the following is a renewable source of energy?**

- F Natural gas**
- G Coal**
- H Oil**
- J Falling water**

**17 When the sea floor spreads apart, volcanoes and ridges are formed because**

- A sediments are deposited where the floor spreads, building ridges**
- B as the plates pull apart, magma moves to the surface, building ridges**
- C ocean water pushes down on the surrounding sea floor, pushing up ridges**
- D underwater earthquakes lift the sea floor into long ridges**



18 Which of these would most likely occur as the ice caps melt?

F The Earth would become cooler.

G The sea would cover more land.

H The rivers would flow more rapidly.

J The rain would be more acidic.

## Mohs Hardness Scale

| Scale Number | Mineral    |
|--------------|------------|
| 1            | Talc       |
| 2            | Gypsum     |
| 3            | Calcite    |
| 4            | Fluorite   |
| 5            | Apatite    |
| 6            | Orthoclase |
| 7            | Quartz     |
| 8            | Topaz      |
| 9            | Corundum   |
| 10           | Diamond    |

The chart shows the Mohs scale for measuring the hardness of minerals. A mineral that can scratch fluorite and can be scratched by orthoclase is able to

- A scratch both calcite and quartz
- B be scratched by both calcite and quartz
- C scratch calcite and be scratched by quartz
- D scratch quartz and be scratched by calcite

20 Cyanite ( $\text{Al}_2\text{SiO}_5$ ), quartz ( $\text{SiO}_2$ ), and leucite ( $\text{KAlSi}_2\text{O}_6$ ) may be grouped together because they all contain

F aluminum

G carbon

H potassium

J silicon

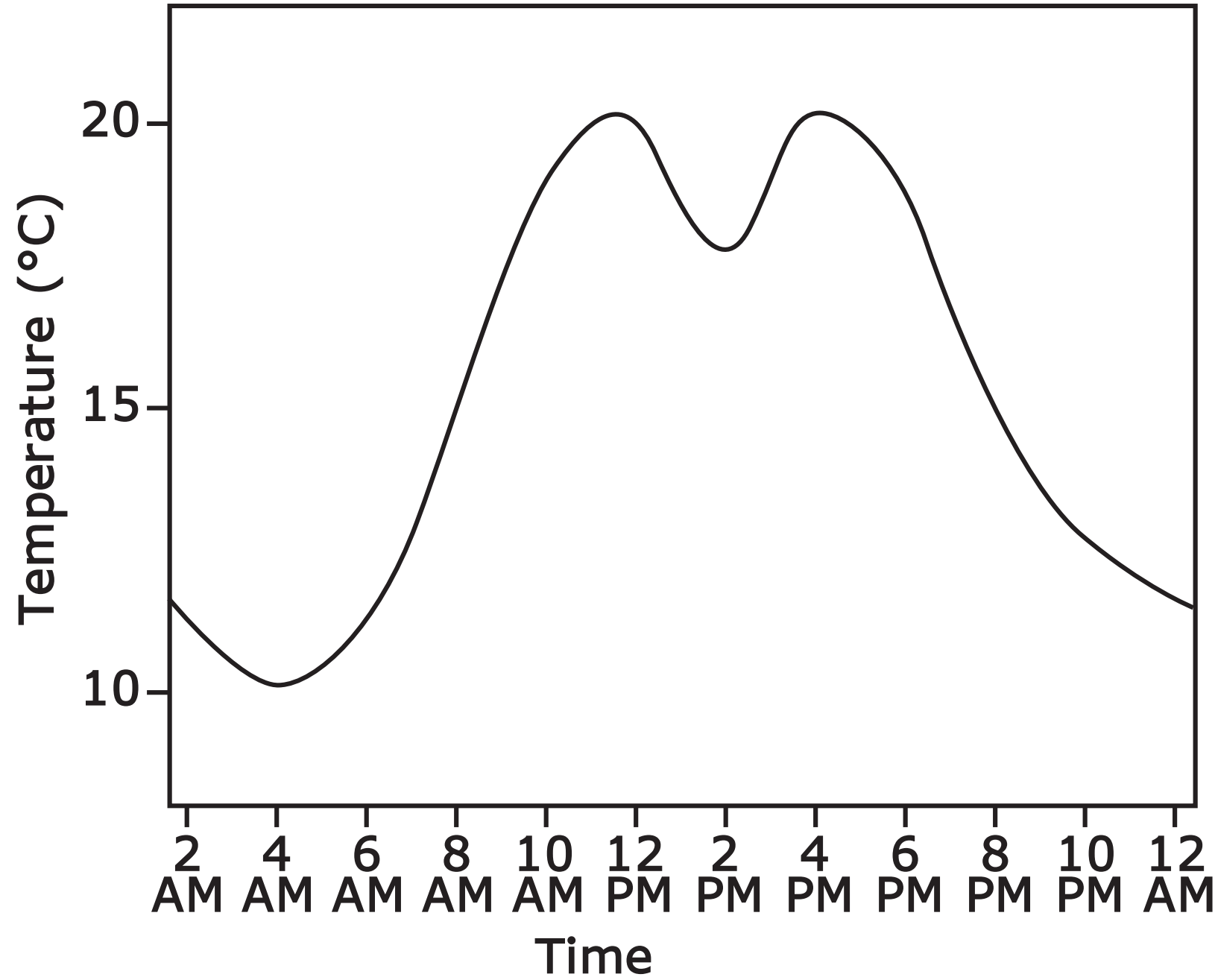
Igneous Rocks

| Type of Magma/Lava | Intrusive | Extrusive                  |
|--------------------|-----------|----------------------------|
| Basaltic           | Gabbro    | Basalt, scoria             |
| Andesitic          | Diorite   | Andesite                   |
| Granitic           | Granite   | Rhyolite, pumice, obsidian |

Of these igneous rocks, which would contain the **LARGEST** crystals?

- A Granite
- B Obsidian
- C Pumice
- D Rhyolite

Outdoor Temperatures for July 15



The graph shows the outdoor temperature at a certain location during a 24-hour period. What possible occurrence happened at 2:00 P.M.?

- F Daylight-savings time
- G Eclipse of the moon
- H A solar storm
- J Thunderstorm passes

- 23 One method of lessening the environmental impact of strip mining is to
- A mine only nontoxic materials
  - B only mine during the evening hours
  - C feed the animals displaced by the mine
  - D require that the landscape and vegetation of mined lands be restored
- 24 By increasing the height of smokestacks, industries in the Midwest reduced the local concentration of air pollutants. However, the pollution was carried by wind to the Northeast where it contributed significantly to
- F reduced rainfall
  - G soil erosion
  - H mass wasting
  - J acid rain

25 Which of the following best explains the rolling topography of the Valley and Ridge province in Virginia?

- A Folding and differential erosion
- B Block faulting of marine sediments
- C Ocean currents and uplift
- D Rifting and ocean waves

26 The fossil fuel found in GREATEST abundance in Virginia is

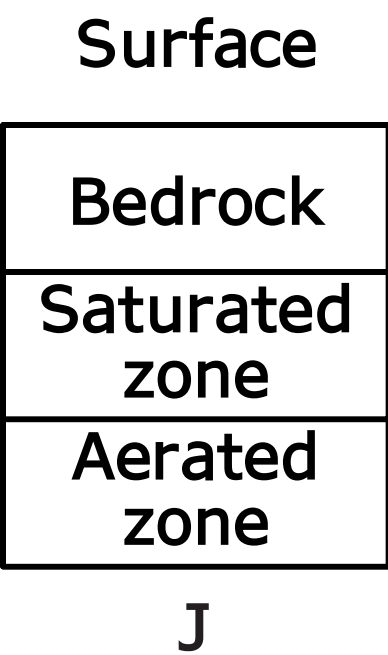
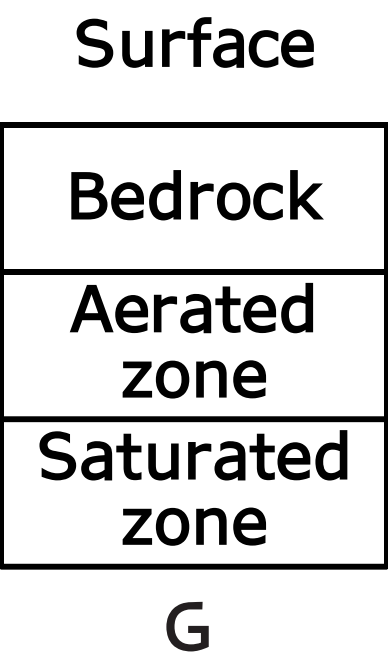
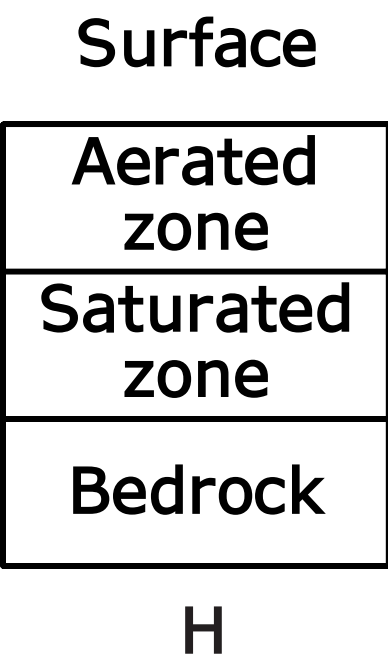
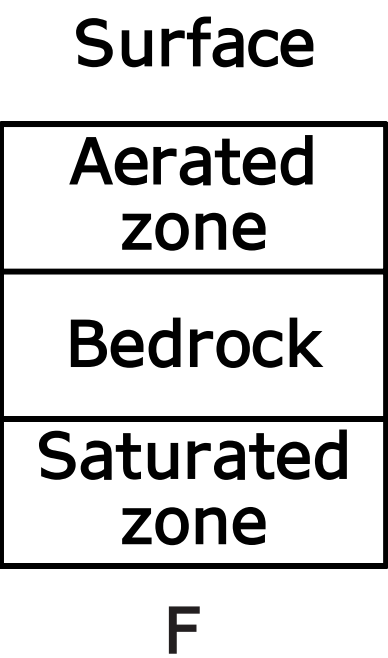
- F oil
- G coal
- H natural gas
- J methane

27 Which of the following is NOT considered a result of the movement of tectonic plates?

- A Earthquakes
- B Mountain ranges
- C Increased volcanic activity
- D Karst topography



28 Which diagram below best represents the most common arrangement of zones in a water table?



**29** Students want to identify a rock in a nearby field.  
Which of the following properties would be MOST useful  
in identifying the unknown rock?

- A** Color
- B** Smell
- C** Mineral content
- D** Specific weight

**30** What is located beneath soil layers?

- F** Bedrock
- G** Humus
- H** Lava
- J** Tundra

31 Organic matter in soil is made from

- A weathered parent rock
- B decayed plants and animals
- C acid rain
- D carbon dioxide

32 During which of these phases of the moon will the tides be highest?

- F Full Moon
- G Quarter Moon
- H Crescent Moon
- J Gibbous moon

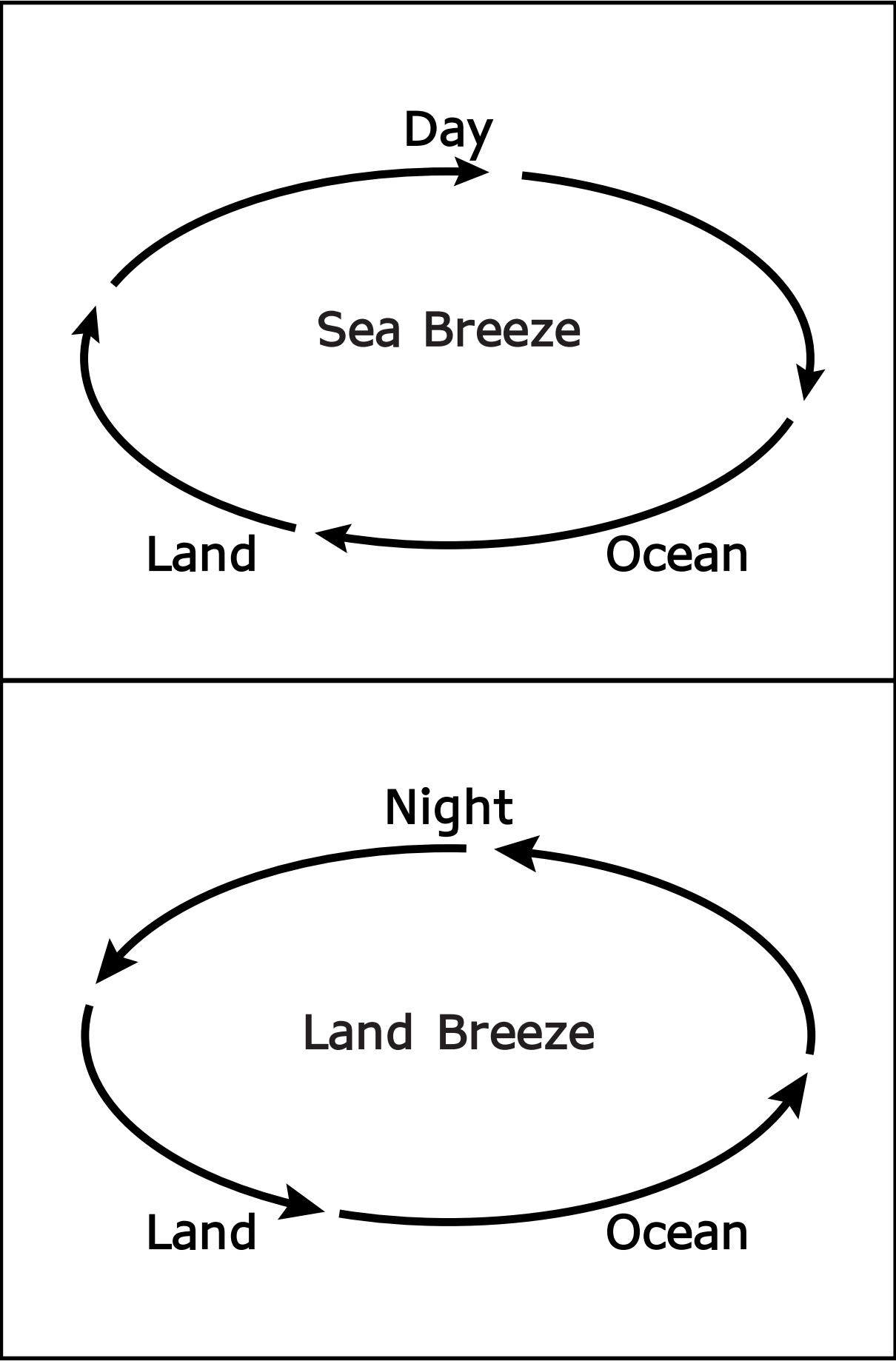
- 33 On clear nights in late summer and early fall in the Shenandoah Valley, why does ground fog form in the low areas near the Shenandoah River?
- A Cool, descending air meets moist air in the low areas near the river.
  - B Cool, moist air ascends from the river to the hilltops.
  - C Warm winds bring moisture from the hills down into the valley.
  - D There is more air pollution in the evenings.
- 34 Why does erosion not occur on the moon?
- F The rock surface of the moon is too hard.
  - G There is no animal life.
  - H There is no wind or rain.
  - J The gravitational pull of the moon is too weak.

**35 Which planet has a fierce hurricane-like storm that is several times the size of Earth?**

- A Mars**
- B Venus**
- C Saturn**
- D Jupiter**

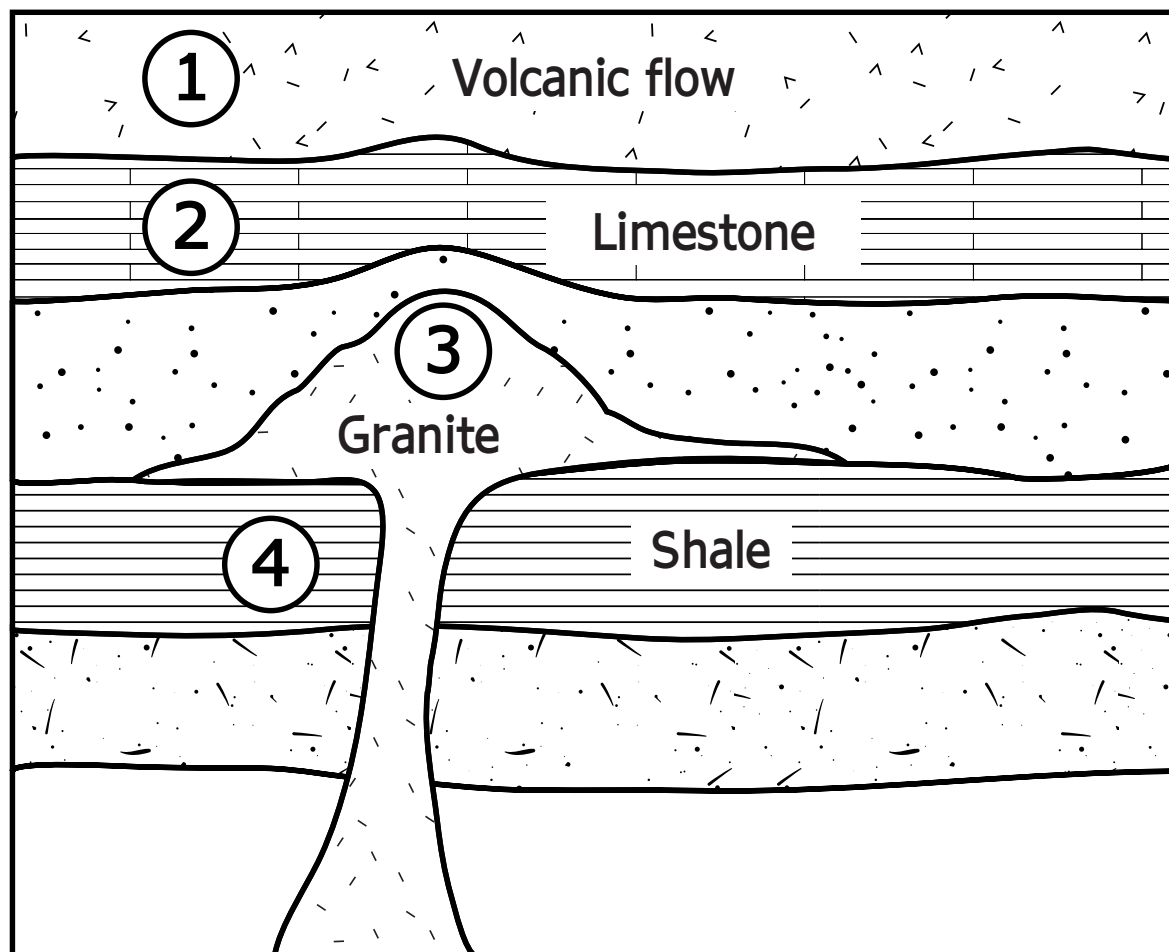
**36 Which of these provides the BEST evidence of the environment in which an igneous rock was formed?**

- F Thickness**
- G Color**
- H Size**
- J Texture**



What would explain the change in the direction of air movement from daytime to night?

- A Water is always cooler than land.
- B Land temperature changes more quickly than water temperature.
- C Cool air rises more quickly than warm air.
- D The sun warms the moist ocean air more than the dry land air.

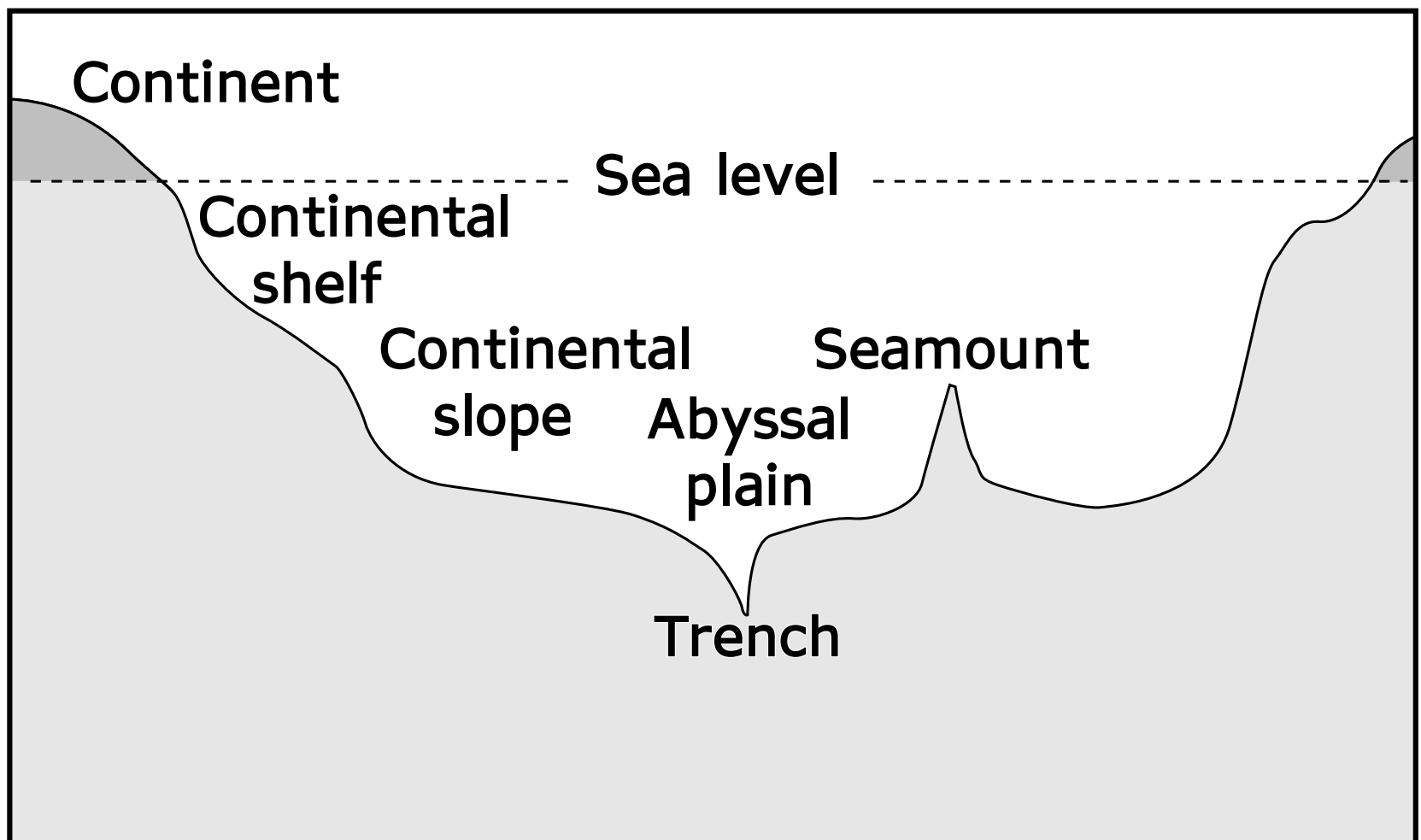


In the illustration shown, which layer is an example of an intrusion?

- F 1
- G 2
- H 3
- J 4



## The Ocean Floor



At which ocean feature would the greatest amount of water pressure be exerted?

- A Continental shelf
- B Continental slope
- C Abyssal plain
- D Trench

- 40 A group of students wants to make a map of a small lake, showing its depth at various points. They plan to row their boat all around the lake and measure the depth at different locations. What other information besides depth should they record at each location in order to have enough data for constructing the map?
- F The temperature at the surface of the water at each location
  - G The position of each depth measurement relative to fixed points on the shore
  - H The time of day the depth was measured at each location
  - J The relative humidity at each location

41 In 1912, an astronomer at Arizona's Lowell Observatory noticed that the lines in the spectra of most galaxies shifted toward the red end of the spectrum. Another American astronomer, Edwin Hubble, later interpreted this discovery as evidence that

- A galaxies were once part of one huge megagalaxy
- B an explosion will one day result from the pressure building as the galaxies expand
- C galaxies are moving away from each other in a constantly expanding universe
- D the largest galaxies are slowly engulfing their smaller neighbors

42 Rocks formed by the cementing of weathered materials are called

F sedimentary rocks

G extrusive igneous rocks

H basalt

J magma

43 What process has occurred when atoms combine to form a new element and release energy?

A Fusion

B Fission

C Hydrogenation

D Ionization

44 Which of these substances plays the MOST important part in chemical weathering?

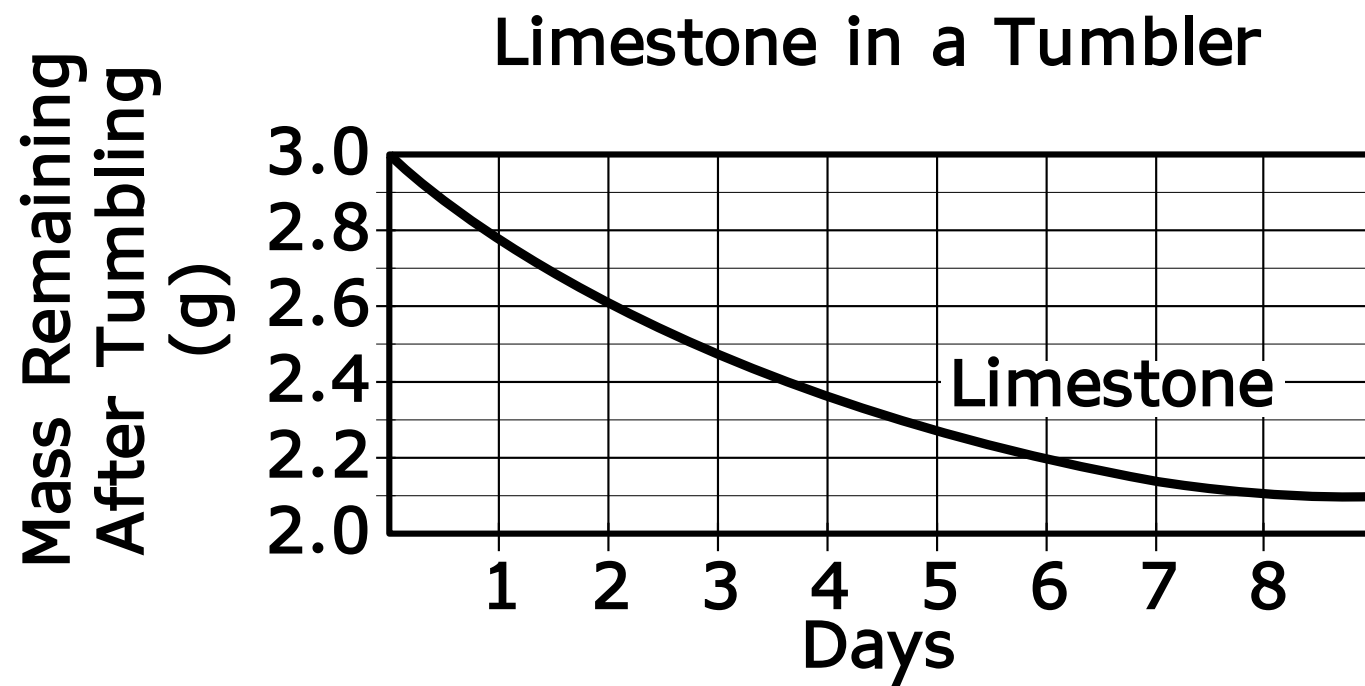
F Wind

G Water

H Ice

J Frost

45



How much limestone was worn away between Day 1 and Day 2?

- A 0.2 gram
- B 2.3 grams
- C 2.5 grams
- D 2.8 grams

46 Extrusive rocks have small grains because they

F cool quickly

G harden underground

H contain rare minerals

J have a rough mixture

## Answer Key

| Test Sequence | Correct Answer | Reporting Category | Reporting Category Description             |
|---------------|----------------|--------------------|--|
| 1             | C              | 004                | Astronomy and Space Science                |
| 2             | G              | 004                | Astronomy and Space Science                |
| 3             | C              | 004                | Astronomy and Space Science                |
| 4             | J              | 002                | Geology                                    |
| 5             | B              | 001                | Scientific Investigation                   |
| 6             | G              | 001                | Scientific Investigation                   |
| 7             | B              | 003                | Meteorology, Oceanography, and Groundwater |
| 8             | H              | 002                | Geology                                    |
| 9             | C              | 002                | Geology                                    |
| 10            | J              | 002                | Geology                                    |
| 11            | C              | 002                | Geology                                    |
| 12            | F              | 003                | Meteorology, Oceanography, and Groundwater |
| 13            | D              | 003                | Meteorology, Oceanography, and Groundwater |
| 14            | G              | 001                | Scientific Investigation                   |
| 15            | A              | 004                | Astronomy and Space Science                |
| 16            | J              | 002                | Geology                                    |
| 17            | B              | 002                | Geology                                    |
| 18            | G              | 003                | Meteorology, Oceanography, and Groundwater |
| 19            | C              | 002                | Geology                                    |
| 20            | J              | 002                | Geology                                    |
| 21            | A              | 002                | Geology                                    |
| 22            | J              | 003                | Meteorology, Oceanography, and Groundwater |
| 23            | D              | 002                | Geology                                    |
| 24            | J              | 002                | Geology                                    |
| 25            | A              | 002                | Geology                                    |
| 26            | G              | 002                | Geology                                    |
| 27            | D              | 002                | Geology                                    |
| 28            | H              | 003                | Meteorology, Oceanography, and Groundwater |
| 29            | C              | 002                | Geology                                    |
| 30            | F              | 002                | Geology                                    |
| 31            | B              | 002                | Geology                                    |
| 32            | F              | 003                | Meteorology, Oceanography, and Groundwater |
| 33            | A              | 003                | Meteorology, Oceanography, and Groundwater |
| 34            | H              | 004                | Astronomy and Space Science                |
| 35            | D              | 004                | Astronomy and Space Science                |
| 36            | J              | 002                | Geology                                    |
| 37            | B              | 003                | Meteorology, Oceanography, and Groundwater |
| 38            | H              | 002                | Geology                                    |
| 39            | D              | 003                | Meteorology, Oceanography, and Groundwater |
| 40            | G              | 001                | Scientific Investigation                   |
| 41            | C              | 004                | Astronomy and Space Science                |
| 42            | F              | 002                | Geology                                    |
| 43            | A              | 004                | Astronomy and Space Science                |
| 44            | G              | 002                | Geology                                    |
| 45            | A              | 001                | Scientific Investigation                   |
| 46            | F              | 002                | Geology                                    |







1 2 3 4 5 6 7 8 9 10 11 12 A B C D E